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## Application of Case Report-Writing in the Training of Radiology Post Graduate Students at Makerere University.

E. Kiguli-Malwadde<sup>1</sup>, M.G. Kawooya<sup>1</sup>, R.O. Omara<sup>1</sup>, S. Bugeza<sup>1</sup>, R. Byanyima<sup>2</sup>, Z. Muyinda<sup>2</sup>, H. Kisembo<sup>2</sup>

<sup>1</sup>Department of Radiology, College of Health Sciences, Makerere University

<sup>2</sup>Mulago Hospital Kampala – Uganda.

**Correspondence to:** Elsie Kiguli-Malwadde, Email: [kigulimalwadde@gmail.com](mailto:kigulimalwadde@gmail.com)

**Background:** Postgraduate medical education is much sought after and has become an issue of global significance, appeal and dimensions. The Radiology postgraduate training at Makerere University has been in existence since 1980. As part of their training students are required to write up 30 cases with the help of their lecturers.

**Methods:** We set out to evaluate the role of case report writing in the training of Radiology postgraduate students. A document analysis of 22 case report sets was done. Questionnaires with closed and open ended questions were administered to the 10 Radiologists and 6 students to get their opinions and ideas on the process and how it could be improved. The quantitative data was analyzed by a statistician and focused on the closed-ended statements. The qualitative data was analyzed by the authors with the help of a qualitative expert.

**Results:** The radiologists and students agreed that case report writing helped students acquire a wide range of competences. They also agreed that it is a reliable and valid method of assessment and has a positive impact on learning. The respondents identified problems that were encountered in the process. They have problems identifying cases that are fully worked up and also their work was made challenging because of poor technology, limited access to references and high cost of producing the cases. The cases exposed the students to a wide range of cases and investigations in radiology and helped them integrate Clinical Medicine and Radiology.

**Conclusion:** Case report writing is a good way of training and assessing post graduate students. It is motivational and also helps them acquire a wide range of competences specifically ability to write scientific articles.

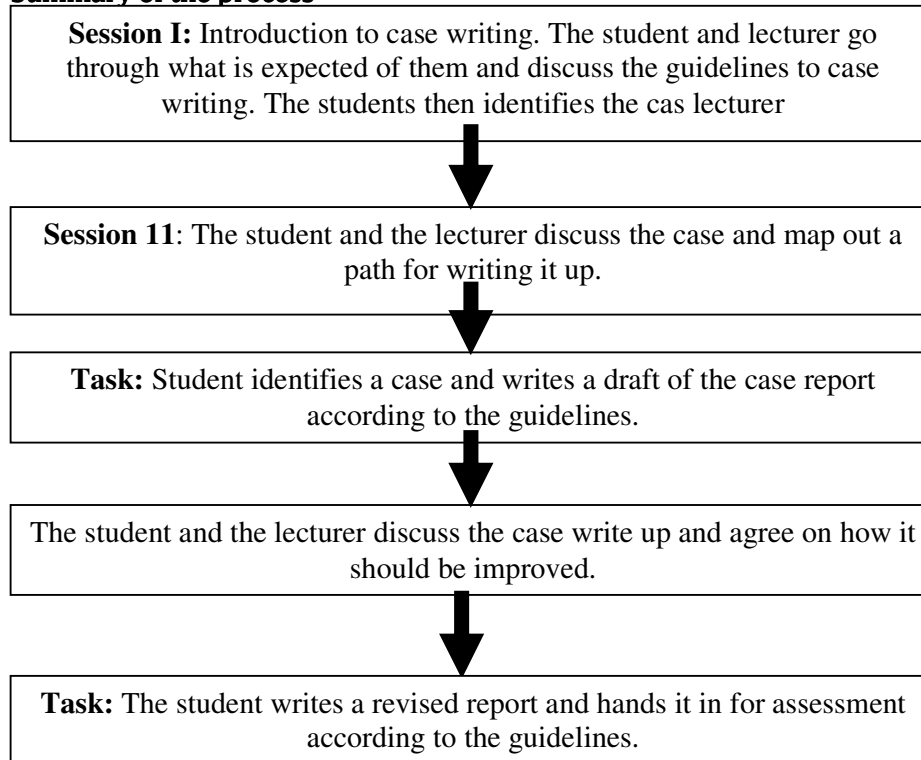
### Introduction.

Postgraduate medical education is much sought after and has become an issue of global significance, appeal and dimensions<sup>1</sup>. The Radiology training programme has been in existence at Makerere University since 1980. The training has a vibrant curriculum that is frequently reviewed. It is a 3 year programme with course work, clinical work and a dissertation. In 1995 something new was introduced. Every candidate was required to write up 30 case reports over the 3 year period. These are spread over the semesters with a student producing 5 cases per semester which are assessed. It has been argued that assessment drives learning and that's why this was incorporated in the process<sup>2,3,4</sup>. The aim of this was to develop students clinical reasoning capacity, develop their case writing skills and help students do in depth studying over the 3 years. Students are encouraged to write up case series and to report unique cases. It is believed that each case contributes to one becoming an expert. Students follow up the cases and make note not only of the Radiology and Imaging results but clinical, laboratory and histopathological data as well. This helps to promote integration of Radiology with Clinical

Medicine. They also identify literature and review it. The students are guided by the radiologists and the cases are assessed and given marks using a set of guidelines that were developed by a team of Radiologists. Each case write up comprises of a title, introduction and literature review, case presentation, discussion, conclusions and references.

These cases train and assess a wide range of competences like knowledge, comprehension, professionalism, critical thinking, health promotion, disease prevention skills, all 4 levels of Millers pyramid, lifelong learning, decision making and self-directed learning. Miller's skills triangle involves the following steps, knows what, knows how, shows how, does and mastery<sup>1,5</sup>) and these are followed as students get more experience in the department. It has been observed that the process of scientific writing uses a unique set of skills that have been acquired by the individual at every stage in the process<sup>6</sup>. It is hoped that this curricular innovation will utilize this principle. These case write ups are also assessed and later improved by the students with the help of the lecturers.

#### Summary of the process



This is repeated for each course and after every 5 cases, they are bound and a mark for the semester is given. The guidelines for assessment include: relevance of the case, uniqueness, variety of investigative modalities used, writing style and content.

#### Subjects and Methods

This has been done since 1995 and 30 students have gone through the process. We set out to evaluate the role of case report writing in the training of Radiology postgraduate

students, to describe the characteristics of the case reports and to establish the opinion of radiologists and students about the case reports. A document analysis of all the reports, types of cases and case series, body systems reported on, investigations done and disciplines involved were looked at. Questionnaires were administered to the 10 radiologists and 6 students to get their opinions about the competences they felt were tested, whether the cases reliably assessed the students competences, what the impact on learning was, what their learning experiences were like, cost, whether cases were published and how the courses could be improved. The questionnaires were pretested for validity

Data were both quantitative and qualitative. The quantitative data was analyzed by a statistician and focused on the closed-ended statements. For data interpretation, 'strongly disagree' and 'disagree' were coded 'disagree', while 'agree' and 'strongly agree' were coded 'agree'. Responses were tallied, coded, counted and percentages were obtained. The qualitative data was analyzed by the authors with the help of a qualitative expert.

## Results

There were 16 respondents, 10 were radiologists and 6 were students. All radiologists are involved in training in the department. There was 100% response to the questionnaires. In the questionnaire the definitions of reliability and validity were included for the benefit of those who did not know what they meant. All the 16 (100%) respondents agreed that case report writing was reliable as an assessment tool. 15 (93.75%) respondents agreed that it is also a valid assessment tool except 1 who disagreed. 16 (100%) respondents reported that it really had a good impact on student learning and 11 (68.75%) of them disagreed that it was an expensive tool. In a nutshell all the respondents supported Case report writing.

**Table 1.** The competences acquired and assessed through the use of case report writing as viewed by participants.

Feature Assessed	Yes	No	Total Number
Medical knowledge	16		16
Patient Care	15	1	16
Radiological Skills	16		16
Interpersonal and Communication Skills	11	5	16
Professionalism	15	1	16
Practice Based learning and Improvement	14	2	16
Health Systems Practice	14	2	16
Research Skills	16		16
Training Skills	14	2	16
Leadership Skills	14	2	16
Report Writing Skills	15	1	16
Critical Literature Appraisal	15	1	16

**Table 2.** Showing that Case Report writing is a Reliable, Valid and has a good impact on student learning as an assessment tool though an expensive method of training.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	No
Case Report writing as a reliable assessment tool				13	3	16
Case Report writing is a valid assessment tool		1		12	3	16
Case Report writing is an expensive method of training	4	7	1	1	3	16

Only 4 (25%) of the respondents had published their cases. The respondents were asked about the problems they encountered during the case reporting. Eleven (68.75%) said they had problems recruiting and identifying cases that were fully worked up. Others identified poor technology, lack of references, non uniformity, high cost and limited time as some of the problems they encountered.

The respondents proposed that the whole exercise could be improved if more time was allocated in the curriculum for this 4 (25%), providing improved literature resources (3/16), if the teachers guided the students more and if the exercise was more standardized. The respondents said they learnt to use a multi disciplinary approach to patient management, got radiology and communication skills, were encouraged to work in a team and also learnt about the publication process.

### ***Document analysis***

Compiled case-write ups from 22 residents were analyzed. The body systems most reported on were the gastrointestinal and musculoskeletal system (n=21) followed by the genitourinary (n=20), central nervous system (n=18), respiratory system (n=17) and cardiovascular system (n=16). Less common were: endocrine, ear nose and throat, ocular, and breast. The whole range of radiological investigations were applied but most commonly plain radiography (n=20) and ultrasound (n=22) followed by computerized tomography and barium studies. Others included intravenous pyelography Doppler studies, arteriography, venography, mammography, galactography, ultrasounded biopsies, echocardiography and CT myelography.

### **Discussions**

It has been reported that publication is vital for dissemination and validation of science<sup>7</sup>. Although not all postgraduates will become researchers it is important for them to be able to write comprehensively about their patients and also be able to report unique cases that they come across. For medical professionals, the ability to communicate ones' findings is very vital and it is even more important for Radiologists as they have to communicate their results to the physicians through report writing. It

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was observed that there was limited research training in residency programmes<sup>8</sup>. So with this in mind it was thought that case report writing would improve scientific writing and so it was incorporated in the residence programme at Makerere University.

It was stated by Maria de Barbosa<sup>9</sup> that a discipline dedicated to the preparation of scientific papers makes a postgraduate programme more effective. This emphasizes the importance of incorporating scientific writing in a postgraduate training like this one. Most radiologists agree that the cases help students to acquire a wide range of competences. This makes this a worthy learning strategy because it responds to most of the competences that a radiologists needs. At the same time this exercise encourages active learning as the student does a lot of active learning with the guidance of a teacher, It helps the student do in depth learning and thinking rather than just recall facts. Fry et al describe case studies as complex examples which give an insight into the context of a problem as well as illustrating the main point. Educational research has also shown case studies to be useful pedagogical tools<sup>10</sup>.

Writing across the curriculum has been reported to improve students' motivation, give more satisfying educational experience for students and instructors and also help to produce students that are better able to think<sup>11,12</sup>. Putting ideas into writing not only clarifies thinking but actually creates ideas by creating new connections among the ideas<sup>13</sup>. It has also been observed that as with other aspects of higher professions curricular, in scientific writing, students start as novices and gradually become experts<sup>14</sup>.

Most residents and faculty find it difficult to conduct research because of other priorities such as patient care. Other constraints include lack of research funds, other resources like libraries, computers, online medical databases, lack of interest, mentoring and support staff with expertise in statistics<sup>15</sup>. To overcome some of these difficulties we decided to make use of patient care to enhance their ability to write and conduct small pieces of research and learn to do literature searches and reviews. This also helps the instructors to actively engage students in writing and also challenges them to write and exercise their skills along with the students. It also helps them do research without requiring a lot of funding. We believe that starting off the students with small pieces of research helps them realize that it is possible to do even bigger pieces and this eventually helps them with their dissertation. Writing a dissertation is requirement for all postgraduate studies at Makerere University. However there are still challenges as this requires a lot of time for both students and teachers and sometimes the cases are incomplete because of lack of resources for full investigation and follow up. These problems were pointed out by the radiologists. They also reported that it was an expensive exercise in terms of time and funds.

The aim of creating a case archive has been achieved however only 4 of the respondents had published 4 pieces of their work. Thus though locally it has been successful, it has not increased the publications output of the department. A reason as to why these cases are not published needs to be identified. It could be that during this period the students are too busy meeting the requirements for the postgraduate (residence) programme to bother about publications. There is need to encourage them to publish the cases in refereed journals. Looking at the document analysis, it showed that all systems were

covered and this helps the student to review a wide range of literature on different systems in the body. At the same time many radiological investigations are covered and this helps the students acquire skills in doing these examinations.

## Conclusion

Using case write up is a good way of training postgraduates (residents) in acquiring skills in scientific writing and preparing them to be future researchers. However at Makerere University there is need to improve it by encouraging the students to go ahead and publish the work in peer reviewed journals.

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